

#### ABSTRACT OF THE DISCLOSURE

A sound source device is connected to one end of a pipe arrangement to supply sound into the pipe arrangement. Regenerators are installed to the pipe arrangement. Each regenerator serves as an energy converter that converts energy of an acoustic wave of the sound, which is propagated in the pipe arrangement, into another form of energy. Acoustic wave amplifier/attenuator apparatuses are provided in the pipe arrangement at a corresponding location between the sound source device and a corresponding one of the regenerators. Each acoustic wave amplifier/attenuator apparatus uses thermoacoustic effect to amplify or attenuate the acoustic wave and includes a cold heat exchanger, a hot heat exchanger and a stack that is held between the cold heat exchanger and the hot heat exchanger.